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Caregiver influences on 'living well' for people with dementia: Findings from the IDEAL study

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ABSTRACT

Objectives: The capability to 'live well' in people with dementia can be influenced by many factors, including those related to the experiences of their informal caregiver. How caregivers experience their own role can affect not only their well-being but also the way they provide care and hence the experience of the person with dementia. The aim of this study is to identify the potential impact of the caregiver's perception of the caregiving experience on how people with mild to moderate dementia self-rate their QoL, well-being and satisfaction with life.

Method: This study utilised time-point 1 data from 1283 informal caregiver and the 1283 people with dementia whom they provide care from the IDEAL cohort study. Multivariate modelling was used to investigate the associations between measures related to the caregiver's perception of the caregiving experience (caregiving stress, perceived social restrictions, caregiving competence, positive aspects of caregiving, and coping) and the self-ratings of QoL, satisfaction with life, and well-being by the person with dementia.

Results: Lower QoL ratings by the person with dementia were associated with high caregiver stress (−1.98; 95% CI: −2.89, −1.07), high perceived social restrictions (−2.04; 95% CI: −2.94, −1.14) and low caregiving competence (−2.01; 95% CI: −2.95, −1.06). Similar associations were found for satisfaction with life and wellbeing. Positive aspects of caregiving and coping were not associated with outcomes for the person with dementia.

Conclusion: The findings indicate that how the caregiver experiences caregiving can affect the person with dementia. This finding reinforces the importance of providing support to caregivers.

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competence; satisfaction
with life; quality of life;
well-being

Informal caregivers are 'the most important resource available for people with dementia' (Department of Health, 2009, p. 12). Recent dementia policy has prioritised enabling people to 'live well' with dementia. To achieve this end the focus has been on improving healthcare and the quality of support offered to people with dementia (e.g. Department of Health, 2009; US Department of Health and Human Services, 2012). However, to provide effective support for people with dementia, it is necessary to identify the factors that can influence people's ability to 'live well'. 'Living well' can be considered a multi-faceted concept; Clare et al. (2014, p. 2) proposed that 'the experience of living well is indexed by positive evaluations of subjective well-being, satisfaction with life, and quality of life (QoL)'. One important aspect of 'living well' is that people with dementia are often cared for by family members or friends (Schulz & Martire, 2004), with caregiving taking place within this social context, where there is a pre-existing relationship between the caregiver and person with dementia (Quinn, Clare, & Woods, 2009). Within this context, it is likely that each member of the dyad will have an influence on the other member's well-being. Indeed, research on people with a chronic illness, including dementia, indicates

that 'living well' can be influenced not only by the effects of the condition on the person but also by the effects on caregivers (Institute of Medicine, 2012). Conversely, factors related to the person with dementia have been shown to influence caregivers' well-being (e.g. Farina et al., 2017; Nogueira et al., 2015). This paper will explore the influence of the caregiver's perception of the caregiving experience on how people with dementia self-rate their QoL, satisfaction with life, and well-being.

Dementia changes the dynamics of pre-existing relationships as one member of the dyad takes on the caregiving role and the other member becomes more dependent. Both members of the dyad will be adjusting to the diagnosis of dementia. Conceptual models that have been developed for the dementia field acknowledge that multiple factors can influence a person's capability to 'live well'. Developed for caregivers, the Stress Process Model (SPM; Pearlin, Mullan, Semple, & Skaff, 1990) identifies different aspects of the caregiving experience that could influence outcomes for caregivers. The SPM includes positive self-concepts, including caregiving competence and positive aspects of caregiving, and mediators of the stress process, which involve coping and social support. Whilst the SPM

has been a dominant conceptual model in the caregiving field, Judge, Menne, and Whitlatch (2010) identified a dearth of conceptual models to explain the experiences of people with dementia. Judge et al. (2010) adapted the SPM to apply it to people with dementia (SPM-IWD). Research using this model indicates that the different outcomes have unique predictors (Dawson, Powers, Krestar, Yarry, & Judge, 2013). In addition, only a small number of factors included in the model are predictive of the outcomes, indicating that other unidentified factors might influence the well-being and QoL of people with dementia. In particular, although the model acknowledges the role of dyadic strain and the importance of the dyadic relationship, additional factors could be explored such as the potential influence of the caregiver's experience, for example caregiver stress, on the experiences of the person with dementia.

There is some evidence that the caregiver's perception of the caregiving experience can influence how people with dementia rate their capability to 'live well' (e.g. Banerjee et al., 2009; Logsdon, Gibbons, McCurry, & Teri, 2002; Martyr et al., 2018). Most of this research has focused on caregiving burden, with the available evidence indicating that higher caregiver burden is typically associated with lower person with dementia self-rated QoL (e.g. Conde-Sala, Garre-Olmo, Turró-Garriga, López-Pousa, & Vilalta-Franch, 2009; Logsdon et al., 2002); however, other studies have reported non-significant associations (e.g. Gómez-Gallego, Gómez-Amor, & Gómez-García, 2012; Sousa et al., 2013). Little attention has been paid to the influence of other factors relating to caregivers' perception of the caregiving experience. Higher caregiver stress has been associated with lower self-ratings of QoL by the person with dementia (Orgeta, Orrell, Hounscome, Woods, & team, 2015; Woods et al., 2014). Only single studies have explored the influence of either caregiving competence (Logsdon, Gibbons, McCurry, & Teri, 2005) or positive aspects of caregiving (Gitlin, Hodgson, Piersol, Hess, & Hauck, 2014) on the QoL of the person with dementia. In relation to the well-being or satisfaction with life of the person with dementia, no study has explored the influence of caregiving stress, perceived social restrictions, caregiving competence, positive aspects of caregiving, and coping.

In summary, to date no study has explored the combined influence of multiple factors relating to the caregiver's perception of the caregiving experience on how people with dementia self-report their QoL, satisfaction with life, and well-being. In this study we will take a comprehensive look at factors relating specifically to the caregiver's perception of the caregiving experience, drawing on those identified as measuring the caregiving experience in the IDEAL study conceptual model of factors potentially associated with 'living well' (Clare et al., 2014): caregiver stress, perceived social restrictions, caregiver competence, positive aspects of caregiving, and coping. All these factors influence caregiver well-being (e.g. Balducci et al., 2008; Boerner, Schulz, & Horowitz, 2004; Quinn, Clare, & Woods, 2010) and therefore may impact on people with dementia. The aim of this study to identify the potential impact of the caregiver's perception of the caregiving experience on how people with dementia self-report their QoL, well-being and satisfaction with life.

Method

Design

This study utilised data from time-point 1 of the IDEAL cohort study (Clare et al., 2014). IDEAL study participants are people with dementia and their informal caregivers. Data for time-point 1 were collected between July 2014 and August 2016 in 29 National Health Service (NHS) sites within England, Scotland, and Wales (Great Britain). The IDEAL study was approved by the Wales Research Ethics Committee 5 (reference 13/WA/0405), and the Ethics Committee of the School of Psychology, Bangor University (reference 2014 – 11684). The IDEAL study is registered with UKCRN, registration number 16593.

Participants

Participants were people with dementia and their respective informal caregivers. People with dementia were eligible to join the study if they were residing in the community, had a clinical diagnosis of dementia (any sub-type), and a Mini-Mental State Examination score (MMSE; Folstein, Folstein, & McHugh, 1975) of 15 or above, indicating that they were in the mild to moderate stages of dementia. The exclusion criteria for people with dementia were a co-morbid terminal illness, inability to provide informed consent and any potential risks to researchers conducting home visits. If the person with dementia was willing to take part in the study and had an informal caregiver, then the caregiver was approached to take part in the study. The study defined caregiver as the primary caregiver who provides unpaid practical or emotional support. For some people with dementia they did not have an informal caregiving who was willing to participate in the study. In this paper we focus on those cases where the person with dementia participated with an informal caregiver.

Measures

The IDEAL study assessments included an extensive set of measures (for details see Clare et al., 2014). The present study uses a specific sub-set of these measures to address the aims of this specific analysis. Details of the reliability of these measures with this sample are provided in Table 2.

Demographic information

Demographic information was collected from the caregiver on their age, gender, ethnicity, education, kin-relationship to the person with dementia, and numbers of hours per week providing care, and dementia diagnosis. Demographic information was collected from the person with dementia on their age, gender, and education.

Measures completed by the caregiver

Caregiver stress. The 15-item Relatives Stress Scale (Greene, Smith, Gardiner, & Timbury, 1982) is a measure of caregivers' perceived stress resulting from caring for their relatives (example item: Do you ever feel frustrated with your relative/friend?). Items are rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (always/considerably),

with a higher score indicating greater stress. The measure has demonstrated good internal reliability in a sample of caregivers of people with dementia, with a Cronbach's alpha of .85 (Greene et al., 1982).

Perceived social restrictions. Two items were used to explore whether the caregiver felt there was anyone else who could help the caregiver if s/he was ill or needed some respite from caregiving. These items, taken from the social restriction scale, were reported in Balducci et al. (2008) where they were used to measure caregiver role inflexibility. Items are rated on a 3-point scale ranging from 1 (yes, I could find someone quite easily) to 3 (no, there is no one), with lower scores indicating better support. The scale has demonstrated good internal reliability in a sample of caregivers, with a Cronbach's alpha of .89 (Balducci et al., 2008).

Caregiver competence. Competence was measured using the 3-item Caregiving Competence scale (Robertson, Zarit, Duncan, Rovine, & Femia, 2007). This assesses caregivers' perception of the adequacy with which they fulfil their role as a caregiver (example item: How often do you feel that you are doing a good job as a carer?). Items are rated on a 4-point Likert scale ranging from 1 (never) to 4 (all of the time) with higher scores indicating greater competence. The scale has demonstrated good internal reliability in a sample of caregivers of people with dementia, with a Cronbach's alpha of .81 (Robertson et al., 2007).

Positive Aspects of Caregiving. The 9-item Positive Aspects of Caregiving scale (Tarlow et al., 2004) measures the rewards and satisfactions of caregiving (example item: Providing help to my relative/friend has made me feel appreciated). Items are rated on a 5-point Likert scale ranging from 1 (disagree a lot) to 5 (agree a lot), with a higher score indicating more positive appraisals of caregiving. The scale has demonstrated good internal reliability in a sample of caregivers of people with dementia, with a Cronbach's alpha of .89 (Tarlow et al., 2004).

Caregiving coping. Caregiving coping was measured by the single item 'do you feel you cope well as a caregiver?' which was taken from the positive value of caregiving subscale of the Carers of Older People in Europe (COPE) Index (McKee et al., 2003). The item is rated on a 4-point Likert scale ranging from 1 (never) to 4 (always).

Measures of 'living well' completed by the person with dementia (PwD)

'Living well' was measured through ratings of quality of life, satisfaction with life and well-being reported by people with dementia.

Quality of life. The 13-item Quality of Life-Alzheimer's Disease measure (PwD-QoL; Logsdon et al., 2000) is a measure of dementia-specific QoL (example item: How do you feel about your energy level?). Items are rated on a 4-point Likert scale from 1 (poor) to 4 (excellent), with higher scores indicating better QoL. The measure has demonstrated good reliability in a sample of people with dementia, with a Cronbach's alpha of .89 (Thorgrimsen et al., 2003).

Satisfaction with life. The 5-item Satisfaction with Life Scale (PwD-SwLS; Diener, Emmons, Larsen, & Griffin, 1985) elicits a global cognitive judgement about one's life (example item: In most ways my life is close to my ideal).

Items are rated on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree), with a higher score indicating better satisfaction with life. The scale has demonstrated good validity and reliability in a sample of older persons (Diener et al., 1985) and in a sample of caregivers of people with dementia (McConaghy & Caltabiano, 2005).

Well-Being. The 5-item World Health Organization-Five Well-Being Index (PwD-WHO-5; Bech, 2004) is a measure of psychological well-being over the last two weeks (example item: I have felt cheerful and in good spirits). Items are rated on a 6-point scale from 0 (at no time) to 5 (all of the time). The scores are summed and transformed into a percentage score, with higher scores indicating better well-being. The scale had moderate internal reliability in a sample of older people (Bonsignore, Barkow, Jessen, & Heun, 2001) and good reliability in a sample of caregivers (Balducci et al., 2008).

Procedure

Participant recruitment and assessment were conducted by researchers from clinical research networks. Participants were recruited from a variety of sources including memory services and Join Dementia Research, a registration service that enables volunteers, including people with dementia, to register their interest in taking part in research (National Institute for Health Research). Potential participants were contacted about the study via telephone and/or postal contact, and those who expressed interest in taking part in the study were visited by a researcher. The researcher completed the eligibility checks and if participants were eligible and agreeable to taking part in the study then the researcher took informed consent and commenced the time-point 1 assessments. People with dementia were administered the assessments whilst caregivers self-completed their assessments. Participants were visited on two further occasions to complete time-point 1 data collection.

Analyses

Preliminary analyses were conducted to test assumptions of normality, linearity, outliers, homoscedasticity, and multicollinearity. As some of the measures were skewed and the distributions deviated from normality, the continuous measures (caregiving stress, perceived social restrictions, caregiving competence, and positive aspects of caregiving) were converted into tertiles. This facilitated comparison between those with high, moderate, and low scores on all the caregiver measures. As only nine participants responded 'never' to the coping question, this category was combined with the 'sometimes' category and re-named as 'low coping'. Similarly, 'often' responses were re-named as 'moderate' coping and 'always' responses were re-named as 'high' coping. Pearson correlations were calculated to explore the associations between the three measures of 'living well'. Since the three measures of 'living well' measures were highly correlated, multivariate modelling was used to investigate differences in self-ratings on measures of 'living well' made by people with dementia across caregiver factors. First, to see if the caregiver factors had individual associations with the measures of 'living well', separate unadjusted models were run for each of the

caregiver factors. These models were then adjusted for covariates relating to the caregiver. These covariates included characteristics of the caregiver (age, gender, caregiver kin-relationship), the caregiving situation (hours per week caregiving) and the dementia diagnosis of the person with dementia. Second, as the caregiver factors of stress, perceived social restrictions, competence, and coping were related to each other, an additional set of multivariate models was applied to investigate whether these factors still had independent relationships with the measures of 'living well' when all these factors were considered together. Caregiving stress, caregiving competence, positive aspects of caregiving, and coping can be considered as factors intrinsic to the caregivers (relating to how they perceive themselves) whilst perceived social restriction is more of an extrinsic factor (relating to how they perceive their situation). All intrinsic factors related to the caregiver were included in one model and then perceived social restriction was added in a further model. Analyses were conducted using Stata 15.1. This study used the IDEAL time-point 1 dataset version 2.

Results

Characteristics of the participating caregivers and people with dementia are shown in Table 1. Of the 1283 caregivers taking part in the study, two-thirds (68.7%) were female and the majority (81%) were spouses/partners. The other types of caregivers (e.g. children, children-in-law, brothers/sisters, grandchildren, nephews/nieces, and step-children) were grouped under 'other family/friends'. Just over half (59.2%) of caregivers provided care for less than 10 hours per week. Of the 1283 people with dementia taking part in the study, just over half were male (58.8%) and the most common diagnosis was Alzheimer's disease (55.7%), followed by mixed Alzheimer's disease and vascular dementia (20.5%). Table 2 reports the participants' scores on the measures. Correlations between the outcome measures indicate that PwD-QoL was strongly correlated with PwD-SwLS ($r = .61$, $n = 1141$ $p < .01$) and PwD-WHO-5 ($r = .69$, $n = 1151$ $p < .01$). PwD-SwLS was strongly correlated with PwD-WHO-5 ($r = .58$, $n = 1237$ $p < .01$).

Table 3 reports the unadjusted and adjusted associations between the caregiver factors and the measures of 'living well' for the person with dementia. In the unadjusted model there was little difference in scores on the measures of 'living well' in relation to the different levels of both positive aspects of caregiving and coping. For the other measures the main difference in scores occurred between the high and low categories. The observed effect sizes were reduced after adjusting for co-variables; however, the differences between high and low categories for caregiving stress, perceived social restrictions, and caregiving competence remained apparent. Lower PwD-QoL was associated with high caregiving stress (-1.98 ; 95% CI -2.89 , -1.07), high perceived social restrictions (-2.04 ; 95% CI -2.94 , -1.14), and low caregiving competence (-2.01 ; 95% CI -2.95 , -1.06). Lower PwD-SwLS was associated with high caregiving stress (-1.35 ; 95% CI -2.64 , $-.44$), high perceived social restrictions (-1.77 ; 95% CI -2.67 , $-.87$), and low caregiving competence (-1.87 ; 95% CI -2.81 , $-.92$). Lower PwD-WHO-5 was associated with high

Table 1. Characteristics of the caregivers and people with dementia.

Demographics	N
Caregivers	<i>n</i> = 1283
Gender	
Female	881 (68.7%)
Ethnicity	
White British	1228 (96.2%)
Age	
<65	369 (28.8%)
65–69	208 (16.2%)
70–74	267 (20.8%)
75–79	223 (17.4%)
80+	216 (16.8%)
Kin-relationship	
Spouse/partner	1039 (81%)
Other family/friend	244 (19%)
Education ^a	
No qualification	265 (21.5%)
GCSE/equivalent	274 (22.2%)
A level/equivalent	374 (30.4%)
College	319 (25.9%)
Hours of care ^b	
<1 hour	232 (18.8%)
1–10 hours	499 (40.4%)
10+ hours	415 (33.6%)
Other responses	89 (7.2%)
People with dementia	<i>n</i> = 1283
Gender	
Female	528 (41.2%)
Age	
<65	103 (8%)
65–69	160 (12.5%)
70–74	232 (18.1%)
75–79	306 (23.9%)
80+	482 (37.6%)
Education ^c	
No qualification	340 (27.2%)
GCSE/equivalent	224 (17.9%)
A level/equivalent	435 (34.8%)
College	252 (20.1%)
MMSE score <i>M</i> (<i>SD</i>)	23.05 (<i>SD</i> = 3.69)
Diagnosis	
Alzheimer's disease	715 (55.7%)
Mixed dementia	263 (20.5%)
Vascular dementia	142 (11.1%)
Frontotemporal dementia	45 (3.5%)
Parkinson's disease dementia	43 (3.4%)
Lewy body dementia	43 (3.4%)
Unspecified/Other dementia	32 (2.5%)

Note. MMSE, Mini-Mental State Examination score; hours of care, hours of care provided on an average day.

^aMissing data for 51 participants;

^bMissing data for 48 participants;

^cMissing data for 32 participants.

caregiving stress (-3.84 ; 95% CI -7.02 , $-.65$), high perceived social restrictions (-2.92 ; 95% CI -6.09 , $.24$), and low caregiving competence (-4.01 ; 95% CI -7.34 , $-.67$).

We conducted further adjusted multivariate models were conducted to investigate whether the caregiver factors retained independent relationships with PwD-QoL, PwD-SwL, and PwD-WHO-5 when all the caregiving factors were combined. In the first adjusted model, which contained caregiving stress, caregiving competence, and coping, only caregiving stress and caregiving competence had independent associations with PwD-QoL, PwD-SwL, and PwD-WHO-5, while the effect sizes were considerably attenuated for coping. In the second adjusted model, which contained just caregiving stress and caregiving competence, caregiver stress and competence had independent associations with PwD-QoL, PwD-SwL, and PwD-WHO-5. Building on this model, the third model (reported in Table 4) included perceived social restrictions; the effect sizes of caregiving stress were slightly reduced, but all three

Table 2. Participants' scores on the measures.

Variables	N (%)	M (SD)	Observed range	Cronbach's alpha
Caregiver rated:				
Stress	1198		0–56	.89
Low	427 (35.6)			
Moderate	373 (31.1)			
High	398 (33.2)			
Social restrictions	1233		2–6	.85
Low	592 (48.0)			
Moderate	380 (30.8)			
High	261 (21.2)			
Competence	1238		3–12	.88
Low	297 (24.0)			
Moderate	574 (46.4)			
High	367 (28.6)			
Positive aspects of caregiving	1234		9–45	.91
Low	562 (45.5)			
Moderate	313 (25.4)			
High	359 (29.1)			
Coping	1242		1–4	N/A
Low	313 (25.2)			
Moderate	586 (47.2)			
High	343 (27.6)			
Person with dementia rated				
QoL-AD	1164	36.89 (5.93)	17–52	.81
SwLS	1248	26.50 (5.9)	6–35	.82
WHO-5	1260	61.43 (20.52)	0–100	.79

Note. QoL-AD, Quality of Life in Alzheimer's disease; SwLS, Satisfaction with Life Scale; WHO-5, World Health Organisation - Five Well-being Index.

Table 3. Associations between individual caregiver factors and ratings of quality of life, satisfaction with life and well-being by the person with dementia.

		QoL-AD	SwLS	WHO-5
		Coefficient (95% CI)	Coefficient (95% CI)	Coefficient (95% CI)
Unadjusted models				
Stress	Low	—	—	—
	Moderate	−1.1 (1.95, −.24)*	−.84 (−1.7, .02)	−3.14 (−6.11, −.16)*
	High	−2.71 (−3.56, −1.86)**	−1.81 (−2.66, −.96)**	−4.88 (−7.83, −1.93)**
Social restrictions	Low	—	—	—
	Moderate	−.35 (−1.15, .46)	−.22 (−1.02, .58)	−.65 (−3.45, 2.15)
	High	−2.15 (−3.06, −1.25)**	−1.83 (−2.73, −.92)**	−3.31 (−6.45, −.16)*
Competence	Low	—	—	—
	Moderate	−.84 (−1.65, −.02)*	−.57 (−1.37, .24)	−1.23 (−4.05, 1.6)
	High	−2.22 (−3.17, −1.26)**	−2.19 (−3.14, −1.24)**	−4.30 (−7.61, −.99)*
Positive aspects of caregiving	Low	—	—	—
	Moderate	−.61 (−1.56, .34)	−.69 (−1.63, .25)	−1.96 (−5.23, 1.3)
	High	−.68 (−1.50, .15)	−1.01 (−1.83, −.19)*	−2.87 (−5.72, −.02)*
Coping	Low	—	—	—
	Moderate	−.54 (−1.37, .3)	−.7 (−1.52, .13)	−.61 (−3.49, 2.27)
	High	−1.41 (−2.38, −.45)**	−1.48 (−2.43, −.53)**	−3.3 (−6.62, .03)
Models adjusted for caregiver gender, caregiver age, kin-relationship, hours per week caregiving, and dementia diagnosis				
Stress	Low	—	—	—
	Moderate	−.64 (−1.51, .24)	−.61 (−1.49, .27)	−2.17 (−5.25, .91)
	High	−1.98 (−2.89, −1.07)**	−1.35 (−2.64, −.44)**	−3.84 (−7.02, −.65)*
Social restrictions	Low	—	—	—
	Moderate	−.18 (−.98, .62)	−.05 (−.85, .74)	−.08 (−2.89, 2.73)
	High	−2.04 (−2.94, −1.14)**	−1.77 (−2.67, −.87)**	−2.92 (−6.09, .24)
Competence	Low	—	—	—
	Moderate	−.47 (−1.29, .35)	−.23 (−1.04, .59)	−.25 (−3.13, 2.62)
	High	−2.01 (−2.95, −1.06)**	−1.87 (−2.81, −.92)**	−4.01 (−7.34, −.67)**
Positive aspects of caregiving	Low	—	—	—
	Middle	−.62 (−1.56, .31)	−.84 (−1.78, .1)	−2.41 (−5.7, .87)
	High	−.76 (−1.59, .07)	−.91 (−1.74, −.08)*	−3.12 (−6.02, −.22)*
Coping	Low	—	—	—
	Moderate	−.09 (−.93, .74)	−.28 (−1.11, .55)	.69 (−2.23, 3.61)
	High	−1.27 (−2.22, −.32)*	−1.26 (−2.20, −.31)*	−3.41 (−6.75, −.07)*

Note. QoL-AD, Quality of Life in Alzheimer's disease; SwLS, Satisfaction with Life Scale; WHO-5, World Health Organisation - Five Well-being Index.

* $p < .05$,

** $p < .001$.

measures were still independently related to PwD-QoL, PwD-SwL, and PwD-WHO-5.

Discussion

This is the first study that we are aware of that has explored the combined influence of multiple factors relating to the caregiving experience on the QoL, satisfaction

with life, and well-being of a large cohort of community-dwelling people with mild to moderate dementia. Previously studies that have included caregiver factors have tended to include single factors, with a focus on examining differences between self and informant ratings or on measure validation (e.g. Gómez-Gallego et al., 2012). There has also been a tendency to focus on the self-rated QoL of the person with dementia as an outcome, with little research

Table 4. Fully adjusted model showing associations between stress, competence, and social restriction with ratings of quality of life, satisfaction with life and well-being by the person with dementia.

		QoL-AD Coefficient (95% CI)	SwLS Coefficient (95% CI)	WHO-5 Coefficient (95% CI)
Model adjusted for caregiver gender, caregiver age, kin-relationship, hours per week caregiving, and dementia diagnosis				
Stress	Low	—	—	—
	Moderate	-.18 (-1.08, .72)	-.21 (-1.11, .69)	-1.33 (-4.51, 1.85)
	High	-1.16 (-2.15, -.18)*	-1.53 (-2.56, -.50)*	-2.30 (-5.79, 1.19)
Social restrictions	Low	—	—	—
	Moderate	.17 (-.65, .99)	.20 (-.62, 1.03)	.46 (-2.45, 3.37)
	High	-1.60 (-2.54, -.66)*	-1.43 (-2.38, -.49)	-2.27 (-5.6, 1.06)
Competence	High	—	—	—
	Moderate	-.19 (-1.04, .65)	-.12 (-.96, .73)	.04 (-2.95, 3.03)
	Low	-1.45 (-2.48, -.43)*	-1.53 (-2.56, -.50)*	-3.25 (-6.87, .38)

Note. QoL-AD: Quality of Life in Alzheimer's disease; SwLS: Satisfaction with Life Scale; WHO-5: World Health Organisation - Five Well-being Index.

* $p < .05$.

using well-being or life satisfaction as outcomes for the person with dementia (Martyr et al., 2018). The findings of this study indicate that caregiving stress, perceived social restrictions, and caregiving competence were associated with outcomes for the person with dementia and all had similar effect sizes. Positive aspects of caregiving and coping were not associated with outcomes for the person with dementia. For caregiving stress, perceived social restrictions, and caregiving competence, the main difference that was observed occurred between caregivers in the high and low categories. In comparison to those reporting low caregiving stress and perceived social restrictions, where caregivers reported high caregiving stress and perceived social restrictions, this was associated with lower self-ratings of QoL, satisfaction with life and well-being by the person with dementia. In comparison to those reporting high caregiving competence, where caregivers reported low caregiver competence, this was associated with lower self-ratings of QoL, satisfaction with life and well-being by the person with dementia.

Research has consistently found that caregivers' perceptions of stress can have a detrimental impact on a caregiver's well-being (e.g. Farina et al., 2017). Models of stress and coping (e.g. Lazarus & Folkman, 1984) identify that stressors and how people appraise these stressors can have an influence on their coping responses, which subsequently have an influence on overall well-being. Extending this, theories of dyadic coping (Bodenmann, 1997) imply that the caregiver's perceptions of stress and subsequent coping responses could influence the responses of the person with dementia. The association between caregiving stress and the outcomes completed by the person with dementia may possibly be due to caregiving stress influencing the caregiver's behaviour. This pattern is seen in the different construct of caregiver burden, which relates to the disruptions in daily routines, relationships and other activities due to caregiving. For example higher caregiving burden has been related to more abusive behaviour and use of a negative or critical emotional tone towards the person with dementia (Cooper et al., 2010; Hinrichsen & Niederehe, 1994). It is likely that the association between caregiving stress and the outcomes for the person with dementia is bi-directional; caring for someone with lower levels of 'living well' may result in increased caregiver stress.

Given that the effect size for caregiving stress was slightly reduced with the inclusion of perceived social restrictions, some of the association between caregiving

stress and outcomes for the person with dementia may be linked to perceived social restrictions. If the caregiver's perceptions of stress are the result of the demands of caregiving then it is feasible that having fewer social restrictions, as a result of receiving more support with caregiving, would reduce caregivers' stress levels. There is some evidence to support this association; interventions that incorporate respite use or day care have resulted in reduced burden (Chappell & Reid, 2002). Lack of support with caregiving has also been linked to more negative perceptions of caregiving (Balducci et al., 2008) and so may have an impact on caregivers' well-being and the level of care they provide. Equally, if the caregiver does not receive any additional help with caregiving then the person with dementia is solely reliant on the caregiver for care and is more likely to be affected by the caregiver's well-being and caregiving style. Caregiving competence had an independent association with outcomes for the person with dementia. It is possible that caregivers' level of competence is influencing their caregiving behaviour and in turn influencing the person with dementia. This would be in line with the pathway proposed by Social Cognitive Theory (Bandura, 1986). Equally, there may be a bi-directional relationship; if the person with dementia is not 'living well' this may then lead to feelings of not providing sufficient support and reduced confidence in the caring role for the caregiver.

Perceptions of positive aspects of caregiving were not associated with 'living well'. It has been suggested that caregiving competence and positive aspects of caregiving are related concepts (Carbonneau, Caron, & Desrosiers, 2010) yet the current study highlights differences in terms of their associations with the outcomes for the person with dementia. It may be that identifying positive aspects of caregiving has benefits for caregivers in terms of their own mood and well-being (e.g. Quinn, Clare, McGuinness, & Woods, 2012; Quinn et al., 2010) but that this does not translate to benefits for the person with dementia in terms of his/her ability to live well. It is also possible that the benefits for the person with dementia are in other domains, such as the quality of relationship between the caregiver and person with dementia (Carbonneau et al., 2010). There has been very little research on the influence of the positive aspects of caregiving on outcomes for the person with dementia (Quinn, 2016), and the findings from this study suggest a need for a better understanding how identifying positive aspects of caregiving influences caregivers' behaviour. For instance, Lim, Griva, Goh, Chionh, and Yap (2011) reported that identifying positive aspects of

caregiving was associated with using encouragement as a dementia management style.

In considering the findings of the current study it is important to reflect on the strengths and limitations. This study involved a large cohort of caregivers and people with mild-to-moderate dementia. The study included people with different dementia diagnoses and caregivers who had differing kin-relationships to the person with dementia. The sample was predominantly white British and further research is required to explore the identified associations in a more ethnically diverse sample. This study was a cross-sectional study and thus can only demonstrate associations between variables in this study. However, IDEAL is a longitudinal study and so we will be able to explore how the associations among these factors change over time. In terms of the measures used, caregiving coping was measured by a single item which focused on a global view of coping. Whilst a concise measure was selected due to the large numbers of variables being explored in the IDEAL study, we recognize that there are more substantive measures of coping that can explore coping styles, more context-specific coping or appraisals of coping efficacy (Gignac & Gottlieb, 1996; Kneebone & Martin, 2003). The participants with dementia self-rated their quality of life, satisfaction with life, and well-being. There has been debate on the reliability of subjective ratings made by people with dementia; however, self-reported QoL by people with mild (Woods et al., 2014) and moderate to severe dementia (Hoe, Katona, Roch, & Livingston, 2005) has been shown to be reliable.

This study specifically focused on the influence of caregivers' perceptions of the caregiving experience on the person with dementia. Future studies with IDEAL data will explore the dyadic influence of shared factors on 'living well', using measures that have been administered to both person with dementia and caregivers. We recognize that the caregiving experience will only be one part of the picture and that many factors influence outcomes for the person with dementia. For instance, the conceptual framework of QoL developed by Lawton (1994) identified four main domains that were important to QoL: psychological well-being, behavioural competence, the objective environment, and perceived QoL. Whilst the caregiving experience could be encapsulated under the objective environment (Logsdon et al., 2002), there are other domains that will also influence the person's QoL. However, the findings from the current study imply that selective aspects of the caregiving experience are associated with outcomes for the person with dementia. This finding is important in terms of the development of interventions and support services for both people with dementia and caregivers.

Implications

The findings of this study provide preliminary evidence that caregivers' perceptions of stress, social restrictions, and competence can influence the QoL, satisfaction with life and well-being of the people with dementia for whom they provide care. Caregivers' perceptions of stress, social restrictions, and caregiving competence can be considered as modifiable and amenable to change. Thus, it is important to consider the influence of these specific caregiver

factors when developing interventions and supportive services aimed at improving the QoL, satisfaction with life and well-being of people with dementia. The findings highlight the need to provide support to caregivers to decrease caregiving stress and enhance feelings of competence, to improve not just caregiver well-being but also the experience of the person with dementia receiving care. Providing effective support to caregivers is important, given findings that poorer caregiver mental health is a unique predictor of mortality people with neurodegenerative disease (Lwi, Ford, Casey, Miller, & Levenson, 2017). There have been some interventions developed to improve caregivers' competence that focus on skills training (e.g. Gitlin, Corcoran, Winter, Boyce, & Hauck, 2001). There have also been interventions developed to reduce caregivers' stress that focus on coping skills (Kajiyama et al., 2013). In addition, improving caregivers' emotional and physical health may also help to alleviate the effects of caregiving stress. This reflects current public health recommendations (Public Health England, 2013) which focuses on improving well-being and opportunities for physical activity. Caregiving may restrict opportunities for engaging in health-related activities and there is evidence that physical activity can reduce burden in caregivers (Orgeta & Miranda-Castillo, 2014). There is less clear evidence about the effectiveness of interventions that focus on reducing social restrictions by improving support with care or even social support (e.g. Chien & Lee, 2011). Support may be formal or informal; it is important to consider not just the amount of support being offered but the quality of support. In terms of formal support, the findings indicate that caregivers would benefit from information about the resources and support services available to them, such as respite care.

Traditionally interventions have been targeted at one member of the dyad, and interventions targeting caregivers can have secondary benefits for the person with dementia by, for instance, improving symptoms (Pinquart & Sörensen, 2006). However, rather than just focusing on the caregiver, our findings highlight the importance of providing support for both members of the dyad. There has been a shift towards the development of more dyadic interventions that aim to support both the caregiver and the person with dementia. Providing interventions to the dyad is considered to be more effective because it is then possible to incorporate the 'synergistic' relationship between the dyad (Laver, Milte, Dyer, & Crotty, 2016). There is some evidence that such approaches can have benefits for both members of the dyad (e.g. Gitlin, Winter, Dennis, Hodgson, & Hauck, 2010; Van't Leven et al., 2013). However, the evidence base is primarily from people in the mild to moderate stages and there is less evidence on effectiveness of these types of interventions in people in the late stages of dementia. In selecting a dyadic intervention it is important to consider the difficulties experienced by the dyad and to select the most appropriate type of intervention accordingly (Van't Leven et al., 2013); therefore, there is a need for more tailored interventions.

In conclusion, we believe that this is the first study to explore the combined influence of multiple caregiver factors relating to caregiver's perception of the caregiving experience on the QoL, satisfaction with life, and well-being of community-dwelling people with mild-to-

moderate dementia. The findings demonstrate the influence of caregiving stress, perceived social restrictions, and caregiving competence on the self-rated QoL, well-being and satisfaction with life of the person with dementia. This study contributes new information about factors to include in interventions to improve outcomes for the person with dementia. In particular, this study highlights the need for support services and interventions to take into account the influence of caregiver factors on the outcomes for the person with dementia. Caregiver stress, perceived social restrictions, and caregiving competence are all modifiable factors that could be appropriately targeted through support services and interventions.

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Author contributions

Authors Quinn, Nelis, Martyr, Morris, Victor, and Clare, were involved in the original conception and design of the project. The lead author Quinn is responsible for the data analysis and interpretation, and for drafting the article. All authors have contributed to the critical revision of the article, and provided final approval of the version to be published.

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